IRPWind ScanFlow Public database

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ScanFlow project

ECN and DTU have set-up an extensive measurement campaign at the ECN test site to characterize the wind turbine inflow wind field. The campaign comprises nacelle LiDAR, short range scanning LiDAR, meteorological mast, ground based LiDAR and turbine measurements. It is put up in the framework of **IRPWind** 1st call for joint projects.

ScanFlow project: "High-resolution full-scale wind field measurements of the ECN's 2.5 MW aerodynamic research wind turbine using DTU's 3D WindScanner and SpinnerLidar for IRPWind's and EERA's benchmark".

Aim: The aim is to establish a unique turbine power performance and induction zone measurement dataset for benchmark purposes.

Key Performance Indicators
- 2 weeks of short-range windscanners (3x)
- 6 weeks of nacelle LiDAR measurements
- 6 weeks of ground based LiDAR, meteorological mast and turbine data
- Public database

Experimental set-up

Layout of the test site with turbine, mast and LiDARs indicated.

ECN Test Site
- 50km North of Amsterdam
- Flat terrain
- 5 research turbines
- West to East line configuration

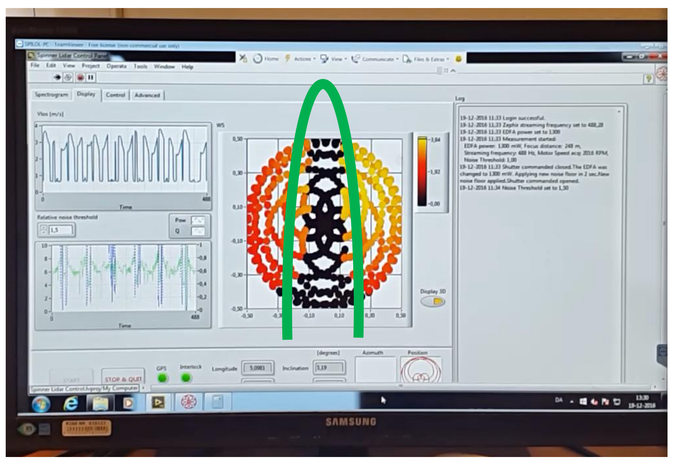
Turbine (N9):
- 1st from East
- Nordex 2.5MW
- H=D=80m

WindCube V2:
- 2.5D from turbine
- East

Nacelle LiDAR:
- Cooler mounted
- Scanpattern
- ~0.8D in front rotor

IEC mast (MM3):
- 1km from turbine
- West
- Ws, wd, T, P, TI, etc.

Short range windscanners:
- R2D1, R2D2, R2D3
- Scanpattern
- ~0.8D in front of rotor



Nacelle LiDAR measurement with blade passage

Nacelle LiDAR installation

Instrumented research turbine

Short range windscanner

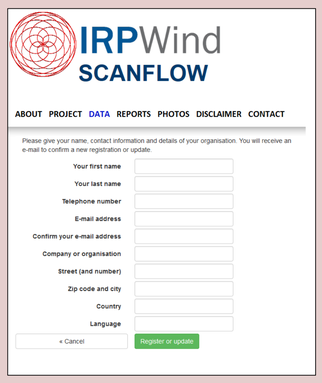
Public Database

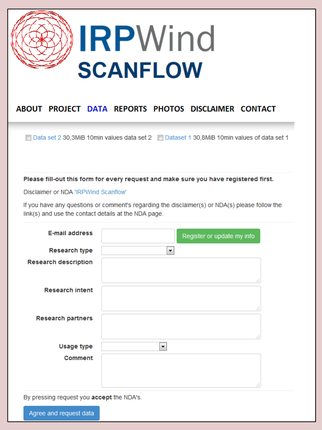
Data Download Scheme:

1. Registration
- ➢ Go to www.irpwind-scanflow.eu website and click on 'DATA'
- ➢ Register as new user
- An email is send to the new user
- ➢ Confirm the registration

2. Data selection
- ➢ Go to www.irpwind-scanflow.eu website and click on 'DATA'
- ➢ Fill out form and click 'Agree and request data' (the NDA/DISCLAIMER is accepted)
- Data request is being considered

3. Data request evaluation
- The request is being evaluated by the project data maintainer/owner
  - Deny. User receives email with denial motivation
  - Accept. User receives email with a download link, which is temporarily valid
- ➢ Download the data





Available data			
MM3	Wind speed 52m, 80m, 108m	**Turbine**	PLC Yaw
	Wind direction 52m, 80m, 108m		PLC Power
	RHT 80m		PLC Rotational speed
	Pressure 80m		PLC Status (binary)
	TI		
WindCube V2	Horizontal wind speed	**Short range scanner R2D1**	Time
	Vertical wind speed	**Short range scanner R2D2**	X coordinate of a right-handed Cartesian coordinate system.
	Wind direction	**Short range scanner R2D3**	Y coordinate of a right-handed Cartesian coordinate system.
	Data availability		Z coordinate of a right-handed Cartesian coordinate system.
	40m, 50m, 60m, 70m, 80m, 90m, 100m, 110m, 120m, 130m		Radial wind speed
Nacelle LiDAR	Time		U-component wind vector
	Index: sample number in scan pattern		V-component wind vector
	LOS velocity		W-component wind vector
	Quality		Scan pattern index
	Power in spectrum		Quality index velocity estimation
	Azimuth		Max power
	x-component unit vector		Total power Doppler spectrum
	y-component unit vector		# measurements per point
	Focus distance		Status
	Inclination		
	ScalingFactor		

Acknowledgements

The work described here has received support from IRPWind, a project that has received funding from the European Union's Seventh Programme for Research, Technological development and Demonstration.

Final Statement

In the ScanFlow project various measurements are being performed to characterize the inflow wind field. These data will publically become available at the end of the project (February 2017) via the website www.irpwind-scanflow.eu. Related websites and important links are www.irpwind.eu, www.windbench.eu and www.windscanner.net.